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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,123	08/16/2000	Leon Awerbuch	4424791-0002	3791
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WHITE & CASE LLP PATENT DEPARTMENT 1155 AVENUE OF THE AMERICAS NEW YORK, NY 10036				
EXAMINER FORTUNA, ANA M				
ART UNIT 1723		PAPER NUMBER		

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/641,123

Applicant(s)

AWERBUCH, LEON

Examiner

Ana M Fortuna

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 8/20/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 8/8/1, 9/8/1, 10/09/8/1, 11/1, 12/1, 13-18, 27-29 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 8/6, 9/8/6, 10/9/8/8/6, 11/4, 11/6, 11/7, 12/11/4, 6-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Allowable Subject Matter

1. Claims 4/3/1, 6, 7, 8/6/1, 9/8/6/1, 10/9/8/6/1, 11/4, 11/6, 11/7, 12/11/4, 12/11/7 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Reasons are stated in the previous final action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 3, 5, 8/1, 10/9/8/1, 11/1, 12/11/112, 14, 15, 16, 17, 18, 27, 28, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Al-Samadi (6,113,797). This rejection has been discussed in the record and is maintained.

4. Claims 1-3, 5, 11/1, 13, 14, 15, 16, 18, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uhlinger (4,341,629). (hereinafter '629).

Reference '629 discloses a process of desalinating water to produce potable water using two ion selective membranes (RO) (elements 16 ad 14), producing a permeate from the membrane 16, module 12,collecting permeate in a tank (20), passing the permeate to a second membrane (18), of module (14), and blending

the permeate from the first membrane with feed from the feed stream, before passing the permeate to the second membrane (abstract, column 4, lines 41-68, column 5, lines 1-7). Varying the proportion of the feed and permeate is not clearly disclosed in '629, however, adding 100 % (all permeate water) to the feed, which more than 5 % of the permeate to the feed going to the second membrane stage¹⁴ (or desalination reverse osmosis unit) is disclosed in '629, providing the system with control valves to regulate the passage of permeate back to the fee (valves 56 and 58), is also disclosed. It would have been obvious to one skilled in the art at the time the invention was made to mix the feed and permeate, e.g. to reduce the level of scaling agents in the feed to the second membrane, which reduces membrane clogging, and operating costs (column 4, lines 13-21). The increase in operating temperature of the system is inherent of the process, and its advantages are part of the operating costs reduction. As to claims 3, and 5, the combination RO (loose membrane), and RO desalination membrane is disclosed in '629 and disc used above. Regarding claim 11/1, reference '629 discloses operating the process with a feed pump which is capable of raising the pressure up to 700Psi (48.32) bars, therefore the operating pressures are within the claimed range as claimed in claim 11. Limitations of claims 13-15 have been discussed above, e.g. recycling o permeate and mixture with feed water before pump 10. As to claim 16, using more than one membrane in the modules 12 and 14, and/or using multiple membrane in parallel or series arrangement is suggested by '629 (column 5, lines 23-31, column 8, lines 60-68, column 9, lines 1-7). Regarding 18, pretreatment of the sea water,

e.g. by chemical addition, prefiltration, etc. is disclosed in '629 (column 4, lines 22-31). As to claims 27-29, treating water of different degree of purity by the system is disclosed in '629, e.g. brackish water, high saline municipal or well water, water containing 36,000ppm of TDS (which includes hardness ions), is also disclosed as feed water (column 2, line 66-68, column 3, lines 1-14, column 5, lines 24-31). The combination of membranes for treating water to produce potable water, including reduction of salinity of the feed to the tight second reverse osmosis membrane (desalination system), is disclosed in reference the reference discussed above, and its advantages in operating cost reduction, e.g. energy reduction, which is generated by the low power consumption and long operating time of the membrane are also disclosed, therefore, since the increase in top operating temperature is based in the reduction of salinity of the feed stream by mixing with a permeate treated stream, this last factor is inherent of the process of '629, and varying the proportion of the feed and the permeated from the first membrane will vary the salinity level of the feed to the second membrane, one skilled in the art at the time the invention was made will expect better performance and higher quality in the potable water by mixing larger amounts of the first permeate from the first membrane, adjusting the volume of water to mixed with the feed, to achieve a desired level of quality, e.g. potable water, as produced by '629, it would have been obvious to one skilled in the art at the time the invention was made.

Claim Rejections - 35 USC § 112

5. Claim10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim is unclear as to whether that particular step applies to the combination of nanofiltration membrane and reverse osmosis, since not heated reject is generated in the reverse osmosis membrane when used as desalination unit.

Drawings

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the heating of the first stream by the reject of the desalination (Reverse osmosis), and the deaeration pretreatment after nanofiltration, as claimed in claim 9, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Response to Arguments

7. Applicant's arguments filed 8/20/03 have been fully considered but they are not persuasive. Arguments directed to the Al-Samadi reference have been considered, however, the rejection is considered proper, applicant argues that

the mixing or blending step is not disclosed in the reference, however, Al-Samadi teaches, treating feed water with a first nanofiltration membrane, treating the concentrate from the first NF membrane in a second NF membrane, the product (permeate, from the second NF membrane contains higher amount of salt than the salt contained in the permeate of first stage), blending these products, and further passing to a desalination (RO unit, is disclosed in the reference (Fig. 3). Mixing the totality of the product produced in the second NF membrane (product 15), with product 14 (Fig. 1), or adding a portion of the permeate and directing a second portion (25, back to the feed stream, is suggested and illustrate in Fig. 3, therefore the limitation (c0 is meet by the reference, since the top operating temperature is inherent of the process, one skilled in the art at the time the invention was made can expect an inherent variation based on the variation of the feed composition to membrane RO (27). Recycling a large fraction, between 10 to 90 % of the permeate from the second NF back to the feed of the first NF membrane is disclosed in the reference ('797), the remaining 10 %, which is at least 5 % is mixed with the permeate from the first NF, and directed to the last reverse osmosis, or tight NF. Furthermore, the recycling of the permeate from the second NF back to the first NF is only suggested when water of high purity level is required, which leaves open the possibility of operating the system by just blending all the permeate (100%) from the second membrane , with the permeate of the first membrane, as shown in Fig. 1, and further treating with a last stage NF(tight), or a reverse osmosis membrane. Since the process is not limited to selecting the "second stream of

water containing higher concentration of hardness ions than the softened water" as the same as the first stream, the rejection is proper. It is clear from A-Samadi, that mixing the feed a treated stream containing lower salinity level improve the quality of the treated water, and reduce membrane operating costs, and therefore operating temperature(column 11, lines 38-50), the same improvement can be expected by mixing or blending subsequent streams , e.g. high salinity stream15, with lower salinity product 14, when the blend (16) is treated in a subsequent ion selective (NF/RO) membranes. One skilled in the art at the time the invention was made will be able to predict final composition of the product, and pressure requirements depending on the salinity level of the feed to the final reverse osmosis (desalination system or unit).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (703) 308-3857. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Ana M Fortuna
Primary Examiner

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November 14, 2003